

REMARKS

Applicants appreciate the Examiner's thorough consideration provided the present application. Claims 1-19 are now present in the application. No amendment has been made in this Reply. Claims 1 and 10 are independent. Reconsideration of this application is respectfully requested.

Claim Rejections Under 35 U.S.C. § 103

Claims 1-19 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Bares, U.S. Patent Application Publication No. US 2002/0075491, in view of Smilansky, U.S. Patent Application Publication No. US 2002/0102013. This rejection is respectfully traversed.

A complete discussion of the Examiner's rejection is set forth in the Office Action, and is not being repeated here.

Independent claim 1 recites a combination of steps including "analyzing pixel data representative of said pixelised image in a color space and based thereon, determining a gray axis defined as a straight line connecting a white point with a black point; determining for each pixel of said pixelised image a shortest distance to said gray axis; forming a cumulative histogram by plotting for the pixels of said pixelised image a value of said shortest distance versus a cumulative pixel count being the number of associated pixels having at least said value of said shortest distance; and analyzing a relationship between the pixels in said cumulative histogram and based thereon judging whether said pixelised image is to be processed as a monochrome image or a color image."

Independent claim 10 recites a combination of steps including “a pre-processor for analyzing pixel data representative of said pixelised image in a color space and based thereon determining a gray axis defined as a straight line connecting a white point with a black point, and determining for each pixel of said pixelised image the shortest distance to said gray axis; an analyzer for analyzing a relationship between the pixels of said pixelised image in a cumulative histogram, said cumulative histogram being formed by plotting for the pixels of said pixelised image a value of said shortest distance versus a cumulative pixel count being the number of associated pixels having at least said value of said shortest distance; and a judging unit for judging, based on said relationship between the pixels in said cumulative histogram, whether said pixelised image is to be processed as a monochrome image or a color image.”

Applicants respectfully submit that the above combinations of steps and elements as set forth in independent claims 1 and 10 are not disclosed or suggested by the references relied on by the Examiner.

The Examiner alleged that Bares in FIG. 2, step 84 and paragraph [0032] discloses “determining for each pixel of said pixelised image a shortest distance to said gray axis” as recited in claims 1 and 10. Applicants respectfully disagree. In particular, Bares in paragraph [0032] discloses:

Respective distances of each of the averaged (reduced) pixels from the neutral axis 22 are determined in the step 84. Then, the number of the distances exceeding a color threshold $T_n(L^*)$, which is determined as a function of a position along the neutral axis, is determined in a step 86. (Emphasis added.)

Bares also defines the “reduced pixel” in paragraph [0030] as follows:

The image 52 is reduced in a step 80 by a predetermined size of a pixel filter. For example, the filter may be sized to include two (2) pixels in the fast-scan direction and three (3) pixels in the slow-scan direction. By reduction is meant a process by which blocks (sub-groups) of the current (intermediate) pixels are averaged. More specifically, if the filter is sized as 2x3 pixels, the components of the six (6) pixels in the filter are averaged independently of each other. For example, all six (6) of the a* values are averaged, all six (6) of the b* values are averaged, and all six (6) of the L* values are averaged to produce a reduced image pixel with components L^*_{avg} , a^*_{avg} , b^*_{avg} . It should also be understood that in this example the number of pixels in the reduced image is only one sixth compared to the original image. (Emphasis added.)

In other words, although Bares discloses determining a distance from the “reduced pixel” to the neutral axis 22, this reduced pixel is simply a “fake pixel” obtained by *averaging* the L* values, the a* values and b* values of a plurality of real pixels (e.g., six (6) pixels in Bares). Bares nowhere discloses determining a distance from each of the real pixels of the image to the neutral axis 22. Therefore, Bares fails to teach “determining for each pixel of said pixelised image a shortest distance to said gray axis” as recited in claims 1 and 10.

The Examiner also alleged that Bares’ teaching in paragraph [0009] related to forming a cumulative histogram as recited in claims 1 and 10. Again, Applicants respectfully disagree. In particular, Bares in paragraph [0009] discloses:

In accordance with another aspect of the invention, the pixels are classified by determining a count of the reduced image pixels having values above a color threshold and classifying the image as one of color and neutral as a function of the count. (Emphasis added)

In other words, the term “count” is only for the “reduced image pixels”, not for the real pixels for the reasons stated above. In addition, only the “reduced image pixels” that have values above a color threshold will be counted as color pixels (see also paragraph [0033]). Therefore, all Bares teaches is simply a final “number” (*i.e.*, the number of color pixels) for an image. In other words, this final number is a single point in a histogram. Unlike Bares, in the present invention, the cumulative histogram is not just a single point, but a plot/relationship presented by a series of values of the shortest distances and the corresponding *cumulative* pixel counts (*i.e.*, a cumulative histogram presented in a distance-versus-cumulative pixel count manner). Since Bares’ count is at most a single point in a histogram, Bares’ count cannot be presented by a series of values of the shortest distances and the corresponding *cumulative* pixel counts to show the above-noted relationship, not to mention the fact that the count is for “reduced pixels”, not for the real pixels. Therefore, Bares fails to teach “forming a cumulative histogram by plotting for the pixels of said pixelised image a value of said shortest distance versus a cumulative pixel count being the number of associated pixels having at least said value of said shortest distance” as recited in claim 1, and “said cumulative histogram being formed by plotting for the pixels of said pixelised image a value of said shortest distance versus a cumulative pixel count being the number of associated pixels having at least said value of said shortest distance” as recited in claim 10.

The Examiner also states that Shishizuka (U.S. Patent No. 5,786,906) in FIG. 17 discloses utilization of a histogram and alleged that one skilled in the art would have the motivation to modify Bared in view Shishizuka’s count histogram to achieve the cumulative

histogram of the claimed invention. Again, Applicants respectfully disagree. In particular, Shishizuka in col. 15, lines 60-67 discloses:

R, G, and B data are input in units of pixels (S401) and are converted into a^* and b^* data by the $XYZ \rightarrow a^*b^*$ conversion unit 411 (S403). A sum $(a^*)^2 + (b^*)^2$ is calculated by the multipliers 412 and 413 and the adder 414, and normalization of the sum is performed (S404). A frequency is then counted (S405). This processing is performed for all predetermined pixels (S406), and a maximum frequency M and a corresponding saturation value S are detected (S407)... (Emphasis added.)

In other words, Shishizuka's "count histogram" in step S405 is simply to count a *frequency of the saturation histogram*, and has nothing to do with a count of "reduce pixels" or real pixels. Therefore, one skilled in the art would not have the motivation to modify Bares' count of "reduce pixels" in view of the *irrelevant* counted frequency of the saturation histogram in Shishizuka.

With regard to the Examiner's reliance on Smilansky, this reference has only been relied on for its teachings related to a liner regression analysis. This reference also fails to disclose the above combinations of elements as set forth in independent claims 1 and 10. Accordingly, this reference also fails to cure the deficiencies of Bares.

Accordingly, none of the utilized references individually or in combination teach or suggest the limitations of independent claims 1 and 10. Therefore, Applicants respectfully submit that independent claims 1 and 10 clearly define over the teachings of the utilized references.

In addition, claims 2-9 and 11-19 depend, either directly or indirectly, from independent claims 1 and 10, and are therefore allowable based on their respective dependence from independent claims 1 and 10, which are believed to be allowable.

In view of the above remarks, Applicants respectfully submit that claims 1-19 clearly define the present invention over the references relied on by the Examiner. Accordingly, reconsideration and withdrawal of the rejection under 35 U.S.C. § 103 are respectfully requested.

Additional Cited References

Since the remaining patents cited by the Examiner have not been utilized to reject the claims, but rather to merely show the state of the art, no further comments are necessary with respect thereto.

CONCLUSION

All the stated grounds of rejection have been properly traversed and/or rendered moot. Applicants therefore respectfully request that the Examiner reconsider all presently pending rejections and that they be withdrawn.

It is believed that a full and complete response has been made to the Office Action, and that as such, the Examiner is respectfully requested to send the application to Issue.

In the event there are any matters remaining in this application, the Examiner is invited to contact the undersigned at (703) 205-8000 in the Washington, D.C. area.

Application No. 10/720,443
Request for Reconsideration dated March 28, 2008
Reply to Office Action of December 28, 2007

Docket No.: 0142-0439P

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§1.16 or 1.17; particularly, extension of time fees.

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Respectfully submitted,

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